<u>REMARKS</u>

The present application was filed on February 20, 2004 with claims 1-19. Claims 4-7, 10-12, 15, 16, 18, and 19 have been withdrawn. Claims 1-19 are presently pending in the above-identified patent application. Claims 2, 3, 9 and 14 are proposed to be canceled herein. Claims 1, 8, 13 and 17 are proposed to be amended herein. Support for the amendments can be found, for example, on page 26, line 23 through page 27, line 5 of the specification. No new matter is being introduced.

In the Office Action, the Examiner rejected claims 1-3, 8, 9, 13, 14, and 17 under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 5,706,498 to Fujimiya et al. (hereinafter "Fujimiya") in view of U.S. Patent No. 6,714,874 to Myers et al. (hereinafter "Myers").

This amendment is submitted pursuant to 37 CFR §1.116 and should be entered. The Amendment places all of the pending claims, i.e., claims 1-19, in a form that is believed allowable, and, in any event, in a better form for appeal. It is believed that examination of the pending claims as amended, which are consistent with the previous record herein, will not place any substantial burden on the Examiner, and Applicants submit that the amendment does not include matter extraneous to the previous record.

The comments of the Examiner in forming the rejections are acknowledged and have been carefully considered.

§103 Rejection

As noted above, the Examiner rejected claims 1-3, 8, 9, 13, 14, and 17 under 35 U.S.C. §103(a) as allegedly being unpatentable over Fujimiya in view of Myers. With regard to the §103 rejections, Applicants initially note that a proper *prima facie* case of obviousness requires that the cited references, when combined, must "teach or suggest all the claim limitations," and that there be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references or to modify the reference teachings. See MPEP §706.02(j). As described herein, Applicant respectfully submits that the combination of references does not teach all of the amended claim aspects.

By way of example, Applicant respectfully submits that the references, alone or in combination, do not teach or suggest the claimed aspect a termination-determining aspect for dynamically determining a termination point for the evaluation of the binding possibility, wherein the termination-determining aspect determines whether the evaluation of the complementary sequence data is carried out over the maximum edit distance and compares a value of min_k and the maximum edit distance k, wherein min_k represents a minimum value of edit distance, and wherein the termination-determining aspect further commands the evaluation processing unit to stop evaluating at a point when the value of min_k becomes greater than k.

Page 6 of the Office Action states that

> Fujimiya et al. do not describe evaluation performed in descending order from a first (maximum) edit distance value to a second edit distance value, the second edit distance value being lower than the first (maximum) edit distance value.

Applicant respectfully asserts that by acknowledging that Fujimiya does not teach or suggest evaluation performed in a descending order from a first edit distance value to a second edit distance value, then Fujimiya inherently does not teach or suggest <u>continuing</u> that evaluation in descending order until a dynamically determined termination point is reached, as now claimed in independent claims 1, 8, 13 and 17.

Further, beginning on page 6, the Office Action claims that

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Myers et al. describe determining the genomic and screening fragments with their complementary sequences..., identifying a high edit score, inserting a column at the left border of the region, sweeping region from left to right and moving bases leftward <u>if such a move decreases the edit score, repeating the sweeping from right to left, comparing alignments produced in both sweeps and keeping the alignment with the lowest edit score</u>... which represents an evaluation is performed in descending order from a first (maximum) edit distance value to a second edit distance value, the second edit distance value being lower than the first (maximum) edit distance value. (Emphasis added)

Applicant respectfully submits that Myers does not teach the claimed aspect of performing a binding possibility evaluation in descending order from a first edit distance value to a second edit distance value, the second edit distance value being lower than the first edit distance value.

Claimed aspects include, for example, *evaluating a binding possibility* of the target nucleotide sequence data to the probe nucleotide sequence <u>via a determination of whether the complementary sequence data of the probe nucleotide sequence is similar to a subsequence of the target nucleotide sequence data</u>, wherein the evaluation is performed in descending order from a first edit distance value to a second edit distance value. Myers, in contrast, teaches correcting an alignment within a window. As acknowledged by the Examiner on page 6 of the Office wherein it is alleged that "It would have been obvious to one of ordinary skill in the art at the time the invention was made to correct alignment within a region as taught by Myers et al. in the screening method of Fujimiya...."

Applicant respectfully submits that "evaluating a binding possibility of the target nucleotide sequence data to the probe nucleotide sequence" is wholly distinct from correcting alignment within a window. As stated in column 24, lines 13-30, Myers teaches that

[e]xperimental data supports the use of an "abacus" algorithm to <u>correct the alignment within a window</u>. In one embodiment, the second stage of the Consensus module 110 performs the following abacus algorithm: (1) select a window around the gappy region using anchored regions of strong alignment as the window's borders, and insert a gap column on the left of the window; (2) seed the first position in the new gap column with the first base in the first non-gap column of the sequences in the window; (3) sweep through the columns from left to right, and for each column, <u>shift each base to the left as far as possible across at least one gap position to align with a previous matching column, if such a move</u>

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would reduce the cumulative edit score within the previously swept columns in the window; (4) repeat steps (1)-(3), moving across the window from right to left; and (5) compare the left-to-right alignment with the right-to-left alignment, and keep the alignment with the lower edit score. (Emphasis added)

Applicant submits that the re-alignment process taught by Myers that calls for the physical shifting of bases is not equivalent or analogous to the claimed aspect of <u>evaluating a binding possibility</u> of the target nucleotide sequence data to the probe nucleotide sequence, as explicitly taught in independent claims 1, 8, 13 and 17.

Additionally, in connection with the amendments proposed herein, Applicant respectfully submits that Myers does not teach or suggest the claimed aspect of dynamically determining a termination point for the evaluation of the binding possibility, wherein the termination-determining aspect determines whether the evaluation of the complementary sequence data is carried out over the maximum edit distance and compares a value of min_k and the maximum edit distance k, wherein min_k represents a minimum value of edit distance, and wherein the termination-determining aspect further commands the evaluation processing unit to stop evaluating at a point when the value of min_k becomes greater than k. Rather, as detailed in the cited portion of Myers above, the reference teaches "sweep[ing] through the columns from left to right" and "from right to left," and "compar[ing] the left-to-right alignment with the right-to-left alignment, and keep[ing] the alignment with the lower edit score."

As such, Applicant asserts that neither Myers nor Fujimiya, alone or in combination, teach the noted claimed aspects. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Further, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Additionally, Applicant respectfully re-submits that neither Fujimiya nor Myers teach the use of the <u>distinct units</u> embodied on a tangible computer-readable recordable storage medium that execute on a hardware processor, as explicitly taught in claims 1, 2, 8, 13, and claims dependent therefrom. Specifically, Applicant asserts that the cited references, individually or in combination, do not teach a target nucleotide sequence storing unit executing on a hardware

processor, a complementary sequence data storing unit executing on a hardware processor, a maximum edit distance storing unit executing on a hardware processor, a storage unit executing on a hardware processor, a evaluation processing unit and <u>a termination-determining unit</u> executing on a hardware processor. As such, Applicant respectfully submits that Fujimiya in view of Myers does not teach or suggest all the claim limitations.

Accordingly, withdrawal of the §103(a) rejection of claims 1-3, 8, 9, 13, 14, and 17 is respectfully requested.

Consequently, all of the pending claims, i.e., claims 1-19, are in condition for allowance and such favorable action is earnestly solicited.

If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below.

Respectfully submitted,

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